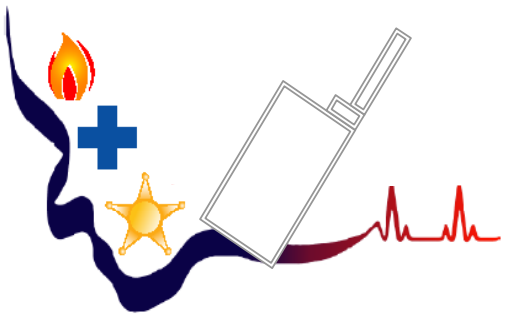

NTIP
Recommended Implementation Schedule
Deliverable-J

NORTHERN TIER INTEROPERABILITY PROJECT

October 7, 2004

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1 Executive Summary

Federal Engineering (***FE***) has recently provided the Northern Tier Interoperability Project (NTIP) consortium with a Baseline System Design document and preliminary maintenance staffing, implementation schedule, cost estimates, and risk analysis for the system as described in the Baseline System Design document. This document is the refinement of the implementation schedule, updated to include additional input from NTIP project participants and information from the vendor community.

FE has included in this document, the methodology applied, the assumptions used, and the final recommendations made based on that information. These recommendations, while believed to be accurate, will continue to be refined throughout the remainder of this project to ensure that the NTIP system is implemented with the minimum risk.

1.1 System Requirements and Implementation

The core system requirements of interoperability, reliability, coverage and capacity have driven the prioritization of the major sub-systems.

The ***FE*** methodology for determining the best approach to prioritizing system implementation is based on both user requirements and system implementation schedule requirements. The optimal schedule attempts to balance these two criteria. ***FE***'s recommendation for prioritizing the various sub-systems is as follows:

1. Wide Area Trunked Voice System
2. Completion of Interconnect Network
3. Local Area Trunked Voice Systems
4. Local Area Conventional Voice Systems
5. P25 Data Systems As Required

The recommended implementation schedule uses this prioritization adjusted to allow for parallel activities where appropriate to most efficiently implement the system. ***FE'***s recommendation is to initially install the wide area portion of the NTIP system. This is intended to most quickly meet the fundamental requirement for interoperable communications while providing seamless roaming for all local agencies. This installation includes the deployment of a significant portion of the interconnection network.

This wide area system deployment will be followed by the implementation of the local area systems. The installations will start with the trunked sub-systems, and the conventional systems will follow. During this phase, the remainder of the interconnection network will be installed.

This prioritization may be impacted by the realities of system deployment in the region. Weather and other schedule factors may affect the order of the sub-system deployment throughout the scheduled implementation time.

1.2 System Implementation Timeline

The system implementation timeline shows the tasks required for the procurement, construction and testing of the NTIP system. This implementation schedule is based on information contained within the NTIP Baseline System Design document. The information used to generate this timeline has been derived from similar system implementations. This helps assure that the proposed NTIP implementation schedule is accurate and applicable.

The NTIP Implementation Schedule below (Chart 1-1) graphically shows how the various tasks are structured.

Recommended NTIP Implementation Schedule

ID	Task Name	Start	End	Duration
1	**Proposal Development**	**11/15/2004**	**1/6/2005**	**7.80w**
2	RFP Release	11/15/2004	11/15/2004	0w
3	Leter of Intent Due	11/29/2004	11/29/2004	0w
4	Pre-Bid Meeting	12/13/2004	12/13/2004	0w
5	Proposals Due	1/7/2005	1/7/2005	0w
6	Evaluation Period	1/10/2005	1/21/2005	2w
7	Evaluation Due	1/24/2005	1/24/2005	0w
8	Design Contract Negotiation	1/24/2005	2/4/2005	2w
9	Design Contract Complete	2/7/2005	2/7/2005	0w
10	Detailed System Design and Implementation Planning	2/7/2005	4/15/2005	10w
11	Design Complete, Implementation Conract	4/18/2005	4/18/2005	0w
12	Site Review	2/7/2005	3/4/2005	4w
13	Equipment Manufacture and Staging	3/21/2005	6/10/2005	12w
14	Wide Area System Implementation	6/13/2005	8/5/2005	8w
15	Local Area Trunked System Implementation	7/11/2005	9/2/2005	8w
16	Local Area Conventional System Implementation	7/25/2005	9/2/2005	6w
17	System Acceptance Testing	9/5/2005	10/28/2005	8w
18	Final Acceptance	10/31/2005	10/31/2005	0w

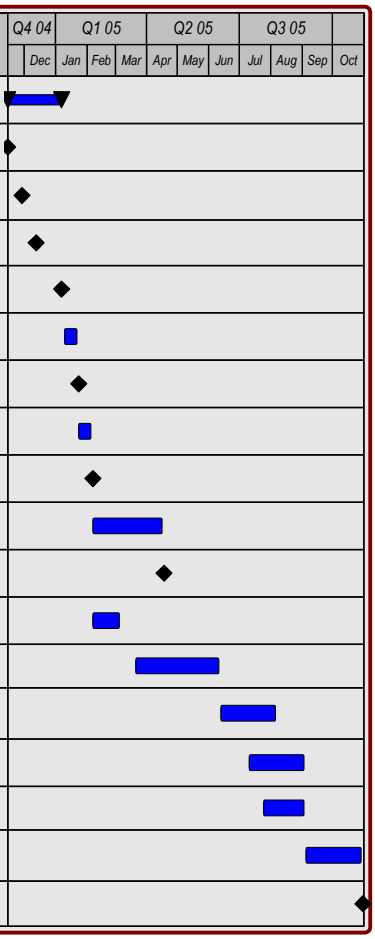

Chart 1-1

The time line shown is based on the RFP being released in mid November 2004, and system acceptance in November 2005. A delayed start date will result in an equally delayed finish date. Both the onset of the winter season, and the restrictions on some of the funding sources may complicate the implementation if there is a significant delay in the start of the procurement.

2 System Implementation Prioritization

FE's recommended system implementation plan is based a prioritization of the system requirements. The requirements documented earlier in this program and presented to the NTIP members have been used to drive the recommended implementation schedule. This prioritization is based on the core NTIP system requirements of interoperability, reliability, coverage and capacity.

The prioritization of the implementation tasks ensures that the core system requirements are given appropriate consideration. This recommended system implementation plan is intended to best meet NTIP's immediate and long-term requirements.

The following chart enumerates the priority given to each of the sub-systems of the NTIP system.

Priority	Sub-System
1	Wide Area Trunked Voice System Includes interconnect network requirements Includes site improvements
2	Remainder of Interconnect Network Includes site improvements
3	Local Area Trunked Voice Systems Includes site improvements
4	Local Area Conventional Voice Systems Includes site improvements
5	P25 Data Systems As Required Includes site improvements

Although these sub-systems are shown prioritized in a linear manner, there will be significant overlap in the actual implementation as discussed later in this document.

2.1 Implementation Plan Overview

The ***FE*** methodology for determining the recommended approach to system implementation is based on both, user system requirements, and system implementation schedule requirements. This optimal approach balances both these criteria.

FE's recommendation is to initially install the wide area portion of the NTIP system. This is intended to most quickly meet the fundamental requirement for providing all agencies with interoperable communications. In addition, this system will provide seamless roaming throughout the region for all local and wide area users. This installation will include the deployment of a significant portion of the interconnection network. The specific interconnection links to be implemented at this time will be determined by the selected vendor during their detailed design work.

Following the deployment of the wide area system, the local area coverage portions of the system will be implemented. The installations will start with the trunked sub-systems, and the conventional systems will follow. During this phase, the remainder of the interconnection network will be deployed. This will provide enhanced local coverage and capacity to counties, municipalities and Indian tribal reservations. At that time, agencies will be provided with dispatch equipment that will provide control of local channels and access to the wide area system for interoperability.

The deployment of the local area systems will begin with the trunked sub-systems, and proceed through the region. The scheduling will take into account the need of each local area, as well as other factors such as the state of installation of the interconnect network, and the availability of appropriate funding.

2.2 Implementation Timing

In developing the implementation schedule ***FE*** has balanced the core requirements of system interoperability, reliability and coverage, against the realities of the Montana environment and the restrictions on the funding sources. As shown in the NTIP Implementation Schedule Gantt Chart in Section 3 (Chart 3-1) the installation work will be completed before November 2005. This schedule will allow the completion the system build out before the onset of the winter months, and aligns with the deadlines for certain grant expenses.

Although this schedule has attempted to avoid site installation during the winter months, weather conditions will likely affect the final implementation timeline. The schedule developed does not contain contingency time for unforeseen events, such as sever weather.

3 System Implementation Timeline

The Recommended NTIP Implementation Schedule Gantt Chart shown on page 11 (Chart 3-1) includes an itemized list of the major tasks and activities that are required to successfully complete this project in the allotted time. This chart displays the principal tasks and associated timelines required for the procurement, construction and testing of the NTIP system.

FE has allotted sufficient time for all tasks in the system implementation schedule to be performed. The schedule does not include unforeseen events such as significant delays due to severe weather conditions, equipment delivery delays or delays in the availability of funding.

3.1 Schedule Methodology

The system implementation schedule was developed from historical data based on radio systems similar to NTIP. Many of these systems were implemented using a phased approach, similar to that proposed for the NTIP system. The timeline presented draws from the commonalties among these systems. The implementation tasks were compared to other well-developed performance plans to derive the data shown in the NTIP

Implementation Schedule chart. Candidates for review include, the most recent Lewis and Clark system, the State of Florida, the State of Nebraska and the State of Wyoming system implementation plans.

3.2 Schedule Assumptions

The development of an accurate implementation schedule depends heavily on the system design and other information. This implementation schedule developed by ***FE*** is based on the best information available. These time estimates and the associated recommended implementation schedule are based on the following assumptions.

- The appropriate funding will be available throughout the system implementation schedule.
- A program manager will be retained prior to RFP release in order to manage the overall program schedule and minimize risks.
- The Northern Tier system will be organized and constructed as described in the NTIP Baseline System Design Document.
- The Northern Tier sub-systems will be organized and prioritized as described in this document.
- No more than ten new site buildings are required to be constructed using prefabricated construction methods.
- No significant weather issues will delay the system implementation.
- No significant equipment delivery delays will occur during system implementation.
- Acceptance testing of the radio system coverage is based on 95% reliability.
- Radio Coverage Acceptance testing is based on a sample of sites and/or areas.

- The Implementation schedule does not include the installation of subscriber equipment.

If during the equipment vender's final detailed system design these assumptions change, or there is the occurrence of events beyond these assumptions, significant schedule changes may also be required. The selected vendor will be responsible for updating the implementation schedule and associated risks throughout the duration of the project.

3.3 Recommended Schedule

The Gantt Chart (Chart 3-1) displays the implementation schedule developed by ***FE***. This schedule starts from the issuance of the Request for Proposals (RFP) on November 15, 2004 and concludes with the final acceptance of the system before November 2005.

The schedule shown makes use of a significant amount of overlap in the implementation of various portions of the NTIP system. The overlapping of schedule events increases the efficiency of the implementation. It does, however increase the management and coordination required.

FE has allocated a period of twelve weeks from the RFP release for the vendors' responses, vendor selection and contract administration. This period of time is typical of a full RFP process and could be shortened if a procurement method other than an RFP is used. The purchasing department that will be coordinating this procurement must evaluate the range of procurement options available. Each particular procurement process will have some schedule impact. Typically an RFP is considered the longest form of procurement, and therefore is used for planning purposes.

System design, site review, equipment manufacturing and staging occupy approximately twenty-two weeks of the system implementation time. The schedule is based on the use of a functional/performance specification rather than a detailed design specification. This reduces the overall risk to the NTIP Consortium and the State by making the selected vendor fully responsible for both the final system design and the resulting system performance.

The installation of the various sub-systems are scheduled with a significant amount of overlap. This is done with the assumption that many of these relatively independent sub-systems will be implemented simultaneously through the use of several installation teams.

The following chart (Chart 3-1) provides a view of the recommended schedule in Gantt Chart form. The resolution of this chat is in one-week increments.

The following sections detail the milestones contained within the NTIP Implementation Schedule.

3.3.1 Vendor Selection and Contract Negotiation

Although there are several methods available to the NTIP Consortium and the State of Montana to procure this system, for our scheduling purposes we have used an RFP. The time line for an RFP is typically the longest and therefore the safest for planning purposes.

3.3.1.1 Release of Request for Proposal (RFP)

During this schedule task item the Request for Proposals (RFP) or other procurement documents will be issued to qualified system suppliers. The vendors will be required to respond with letters of intent-to-bid within the first two weeks. Preliminary questions on the RFP will be requested to be attached to the letter.

3.3.1.2 Pre-Bid Conference

Within four weeks of the issuance of the RFP, a pre-bid conference will be held to answer questions pertaining to the RFP. The timing of this meeting will allow the vendors to receive answers to any preliminary questions asked with the letter-of-intent-to bid. It is anticipated that this meeting will be mandatory.

Recommended Project Schedule
Gantt Chart

ID	Task Name	Start	End	Duration
1	**Proposal Development**	**11/15/2004**	**1/6/2005**	**39d**
2	RFP Release	11/15/2004	11/15/2004	0d
3	Leter of Intent Due	11/29/2004	11/29/2004	0d
4	Pre-Bid Meeting	12/13/2004	12/13/2004	0d
5	Proposals Due	1/7/2005	1/7/2005	0d
6	Evaluation Period	1/10/2005	1/21/2005	10d
7	Evaluation Due	1/24/2005	1/24/2005	0d
8	Design Contract Negotiation	1/24/2005	2/4/2005	10d
9	Design Contract Complete	2/7/2005	2/7/2005	0d
10	Detailed System Design and Implementation Planning	2/7/2005	4/15/2005	50d
11	Design Complete, Implementation Conract	4/18/2005	4/18/2005	0d
12	Site Review	2/7/2005	3/4/2005	20d
13	Equipment Manufacture and Staging	3/21/2005	6/10/2005	60d
14	Wide Area System Implementation	6/13/2005	8/5/2005	40d
15	Local Area Trunked System Implementation	7/11/2005	9/2/2005	40d
16	Local Area Conventional System Implementation	7/25/2005	9/2/2005	30d
17	System Acceptance Testing	9/5/2005	10/28/2005	40d
18	Final Acceptance	10/31/2005	10/31/2005	0d

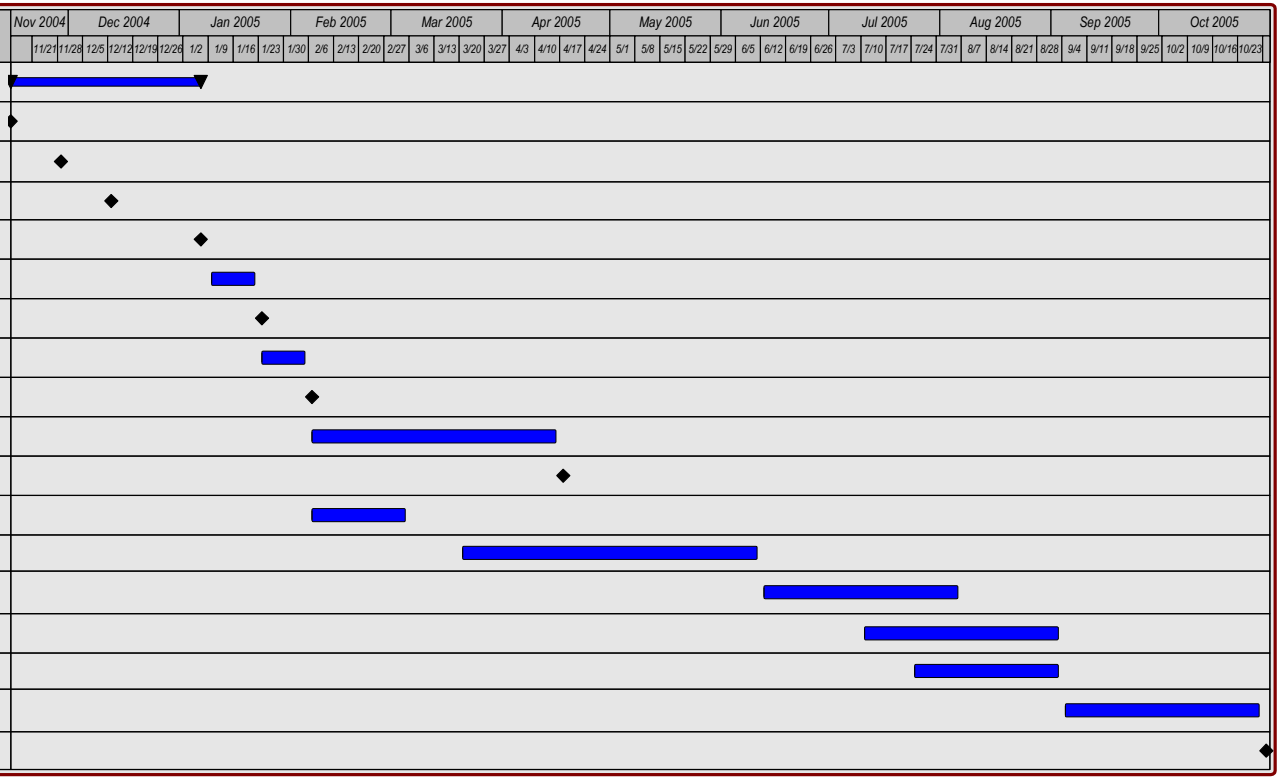

Chart 3-1

3.3.1.3 Proposals Submittal, Review and Vendor Selection

Proposals will be due for evaluation eight weeks after the RFP was issued. During the two weeks following submittal, finalists may be requested to make presentations on their proposals. Proposal evaluation is scheduled to occur during these two weeks. After which the successful vendor will be notified.

3.3.1.4 Contract Negotiation

The two weeks following the announcement of the successful vendor will be used to negotiate a contract for the design phase of the project.

3.3.2 Vendor Detailed System Design

The selected vendor will proceeds with their design and planning activities during the next ten weeks.

3.3.2.1 Detailed System Design

The Vendor Detailed System Design schedule task item is the initial activity once a contract is established between the NTIP Consortium and/or the State and the selected vendor. The work in this task item is the development of the NTIP Final System Design documents. These documents will detail the design and specifications of the system infrastructure. The Final System Design document will include a system description, system drawings, finalized equipment list, finalized site list, finalized coverage prediction maps, proposed factory, subsystem, and system testing methodologies, proposed acceptance tests, and other documentation as required to firmly define the system to be implemented.

3.3.2.2 System Implementation Plan and Contract

In parallel with the Detailed System Design work, and during the same ten week period, the vendor will also provide an updated task list and description reflecting all activities to be completed as part of the system implementation and deployment. These documents will then be submitted to the to the NTIP project team for review and approval. Once approved, these will become the Statement of Work (SOW) for the system implementation contract.

Any additional negotiations required to create a firm and executable implementation contract between the NTIP Consortium and/or the State and the system vendor will be scheduled to complete in this time frame.

3.3.3 Site Review

Site review will occur during the first four weeks of the Detailed System Design phase. During the site review task item, the radio and microwave sites that will be utilized in the system development will be inspected to ensure they meet the physical and electrical requirements for the proposed site equipment. The results of the site review will be documented and incorporated into a site audit report.

Additional site selection activities may be required if one or more selected sites are found to be unsuitable, or unavailable for use. This could have schedule impact. There is also the possibility for cost impacts if the conditions of the sites are found to be significantly different than expected. This issue should be addressed with the selected vendor early during the design stage to minimize schedule and cost risks to the system implementation.

3.3.4 Equipment Manufacturing and System Staging

Equipment manufacturing and staging are scheduled to take twelve weeks. The manufacture of the equipment should begin as early as possible to reduce the risk of delaying implementation. ***FE*** recommends that the majority of the equipment be put on order six weeks into the ten week design process.

During this task item the system equipment will be manufactured, tested and configured at the vendor's facility. The NTIP project team will review the system's operational specifications with the vendor to establish the final features and configuration for the equipment.

The total system will then be staged at a facility capable of supporting the integration of all the various sub-systems. The staged system will be configured, integrated and tested as one integrated system. The staged system equipment will then be demonstrated and tested to the system operational requirements agreed upon by the vendor and NTIP project team. This test will be witnessed and approved by the NTIP Program Manager.

3.3.5 Wide Area System Implementation

The wide area system installation is scheduled to take eight weeks and will commence immediately after successful testing of the staged system. This task includes the physical placement, testing and optimization of the fixed network equipment for the wide area trunked system. This equipment includes the radio equipment, microwave equipment, antenna systems and network control equipment. During this time, all wide area radio sites will be installed and preliminary system functional and coverage tests will be conducted.

3.3.6 Local Area Trunked System Implementation

The local area trunked system installation is scheduled to take eight weeks and commence four weeks after the successful completion of testing of the staged system. This time is included to allow the vendor to free up resources from the wide area deployment for this activity. ***FE*** recommends that this activity start as soon as possible after the start of the wide area implementation.

This task includes the physical placement, testing and optimization of the fixed network equipment for the local area trunked systems. This equipment includes the radio site equipment, additional microwave equipment, and antenna systems. During this time the radio sites providing local coverage will be installed, and preliminary system functional and coverage tests of these systems will be conducted.

3.3.7 Local Area Conventional System Implementation

The local area conventional system installation is scheduled to take six weeks and commence two weeks after the start of the local area trunked system implementation. ***FE*** recommends that this activity start as soon as possible after the start of the local area trunked system implementation.

The local area conventional system installation includes the physical placement, testing and optimization of the fixed equipment for the local area systems. This includes the conventional radio equipment, additional microwave equipment as required, antenna systems, and console equipment. During this time additional radio sites providing local coverage will be installed, and preliminary system functional and coverage tests of these systems will be conducted.

3.3.8 System Acceptance Testing

The Acceptance Test stage is scheduled to last eight weeks and will commence immediately following the installation of the local area systems. During this task, the vendor will verify that the system specifications meet those agreed to in the System Design Document. Acceptance testing will include verification of the system functionality, performance, capacity and coverage. In addition, the any deficits in critical parameters will be corrected.

3.3.9 Final System Acceptance

Final system acceptance will occur only after the vendor has successfully demonstrated, to the satisfaction of the NTIP Consortium, the full operation and functionality of the system. This will assure the NTIP Consortium and the State that the final system, as delivered and deployed, will meet the needs of the NTIP member agencies. This event will occur following the system acceptance testing activities. This event will also trigger the beginning of the warranty period.

3.4 Implementation Summary

This recommended implementation plan is based on the best information available at this time. As the design is refined it will be reviewed and updated. This will occur with each subsequent stage in the project development. The implementation schedule will be finalized as part of the Statement of Work (SOW) delivered by the selected vendor with their final detailed design.

4 Schedule Risk Issues

The baseline design and the associated implementation plans are based on the information provided to ***FE*** including the previous studies and existing system information provided by the NTIP member agencies. The needs analysis generated from this information was presented and agreed to by the NTIP

member agencies. However, as with any project this large and complex, there still are several areas where risks exist.

The implementation schedule presented earlier in this document is based on a set of assumptions. The violation of these assumptions or the occurrence of events beyond these assumptions could add schedule and/or financial risk. The critical assumptions are repeated here for clarity.

- The appropriate funding will be available throughout the system implementation schedule.
- A program manager will be retained prior to RFP release in order to manage the overall program schedule and minimize risks.
- The Northern Tier system will be organized and constructed as described in the NTIP Baseline System Design Document.
- The Northern Tier sub-systems will be organized and prioritized as described in this document.
- No more than ten new site buildings are required to be constructed using prefabricated construction methods.
- No significant weather issues will delay the system implementation.
- No significant equipment delivery delays will occur during system implementation.
- Acceptance testing of the radio system coverage is based on 95% reliability.
- Radio Coverage Acceptance testing is based on a sample of sites and/or areas.
- The Implementation schedule does not include the installation of subscriber equipment.

As the design and schedule are refined, the risk factors that remain will require specific attention. Each risk factor will need to be addressed with a contingency or mitigation plan. Additional schedule risk could be created due to delays within the NTIP Consortium regarding approvals and decisions. It should be noted that the proposed schedule does not contain contingency time.